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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/746,675	12/22/2000	Lawrence T. Clark	42390P9854	1642

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EXAMINER

DEMAKIS, JAMES A


ART UNIT

PAPER NUMBER

2836

DATE MAILED: 09/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/746,675	Applicant(s) CLARK ET AL.	
	Examiner James A Demakis	Art Unit 2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment of 2/27/2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 17-19, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 15, 18, 19 and 21 is/are rejected.
- 7) ☒ Claim(s) 13, 14, 17 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The amendment filed 2/27/2004 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the junction diodes formed by the source and drain regions of the bulk region of the charge protection device.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Objections

2. Claim 12 is objected to because of the following informalities:

Minor typo; 3rd line, after "that is higher", change "that" to "than". Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1,3 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one

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skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The junction diodes formed by the source and drain regions in a bulk region are not described in the specification with specific details to enable one of ordinary skill in the art to ascertain the reverse body biasing of the inherent PN junction diodes.

5. Claims 3-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 3, it is not clear if a bulk region of the charge protection device is another one, different from that of claim 1.

In claim 4, it is not clear if a reverse body biasing voltage potential is another bias, different from that of claim 1.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Manning, 6163044.

Manning discloses a method and circuit for reducing sub-threshold leakage currents of transistors in an IC 10 which includes a semiconductor substrate 12 that has MOS transistors 14 formed on it. An internal back-bias voltage V_{bbint} has a magnitude

and a polarity that reverse biases the source-substrate junction diode 36, and the drain-substrate junction diode 38 during normal operation; see 2:29-40, 3:3-12. Additionally, an external back-bias voltage V_{bbext} is applied to the substrate 12 at a terminal 40, allowing for a greater reverse bias voltage to be applied across the source and drain substrate junctions 36, 38. The internal back-bias V_{bbint} may equal the supply voltage V_{dd} and the external back-bias voltage V_{bbext} , which reads on the V_{ccp} circuit, has a magnitude greater than V_{dd} ; see 3:12-26.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 4-12,15,17-19,21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manning as applied to claims 1-3 above, and further in view of Maloney et al (USPN 5907464) and in view of Hirayama et al (USPN 5461338).

Regarding claims 4-12,15,17-19,21:

Manning does not disclose removing the reverse body biasing during an ESD event to the IC.

Maloney et al disclose ESD protection MOS circuits for an IC, such as in Figure 5 where PFET 502 is used as an ESD clamp to conduct charge away during an ESD

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event, yet be turned off during normal operating conditions, see Col. 4, lines 52-60.

Also, Figure 8 shows a PMOS clamp with the use of series transistors, PFETs 828 and 830 as a switchable conductive circuit, either or both may be switched; and voltage divider formed by PFET's 802,804. Additionally, Figure 10 shows the use of a resistive connected PFET 1024 and NFET 1026 which controls the substrate/n-well biasing of the PMOS 1010 clamp.

Hirayama et al disclose the use of body bias to reduce leakage currents. From an active mode to a standby mode, a control circuit 4 changes the substrate bias voltage to cause a reverse bias in the transistor body or substrate, by increasing threshold voltages of a MOS transistor during the standby mode to reduce or cutoff leakage current, see Col.2, lines 26-39.

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified Manning with the teachings of Maloney et al and Hirayama et al to increase the threshold voltage and thereby decrease the leakage current when the transistor is not in an ESD protection mode, because reducing leakage current reduces the overall power consumption of the IC.

Regarding claim 12:

It has been held that the recitation that an element is "adapted to" perform a function is not a positive limitation in any patentable sense; In re Hutchison, 69 USPQ 138.

Allowable Subject Matter

10. Claims 13-14,17,22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Amendment

11. Applicant is reminded that Amendment practice has been revised. The amendment to the claims filed on 2/27/2004 does not comply with the requirements of 37 CFR 1.121(c) because the text of any cancelled claim is not to be presented. However, this amendment is allowed at this time.

Amendments to the claims filed on or after July 30, 2003 must comply with 37 CFR 1.121(c) which states:

(c) *Claims*. Amendments to a claim must be made by rewriting the entire claim with all changes (*e.g.*, additions and deletions) as indicated in this subsection, except when the claim is being canceled. Each amendment document that includes a change to an existing claim, cancellation of an existing claim or addition of a new claim, must include a complete listing of all claims ever presented, including the text of all pending and withdrawn claims, in the application. The claim listing, including the text of the claims, in the amendment document will serve to replace all prior versions of the claims, in the application. In the claim listing, the status of every claim must be indicated after its claim number by using one of the following identifiers in a parenthetical expression: (Original), (Currently amended), (Canceled), (Withdrawn), (Previously presented), (New), and (Not entered).

(1) *Claim listing*. All of the claims presented in a claim listing shall be presented in ascending numerical order. Consecutive claims having the same status of "canceled" or "not entered" may be aggregated into one statement (*e.g.*, Claims 1–5 (canceled)). The claim listing shall commence on a separate sheet of the amendment document and the sheet(s) that contain the text of any part of the claims shall not contain any other part of the amendment.

(2) *When claim text with markings is required.* All claims being currently amended in an amendment paper shall be presented in the claim listing, indicate a status of "currently amended," and be submitted with markings to indicate the changes that have been made relative to the immediate prior version of the claims. The text of any added subject matter must be shown by underlining the added text. The text of any deleted matter must be shown by strike-through except that double brackets placed before and after the deleted characters may be used to show deletion of five or fewer consecutive characters. The text of any deleted subject matter must be shown by being placed within double brackets if strike-through cannot be easily perceived. Only claims having the status of "currently amended," or "withdrawn" if also being amended, shall include markings. If a withdrawn claim is currently amended, its status in the claim listing may be identified as "withdrawn—currently amended."

(3) *When claim text in clean version is required.* The text of all pending claims not being currently amended shall be presented in the claim listing in clean version, *i.e.*, without any markings in the presentation of text. The presentation of a clean version of any claim having the status of "original," "withdrawn" or "previously presented" will constitute an assertion that it has not been changed relative to the immediate prior version, except to omit markings that may have been present in the immediate prior version of the claims of the status of "withdrawn" or "previously presented." Any claim added by amendment must be indicated with the status of "new" and presented in clean version, *i.e.*, without any underlining.

(4) *When claim text shall not be presented; canceling a claim.*

(i) No claim text shall be presented for any claim in the claim listing with the status of "canceled" or "not entered."

(ii) Cancellation of a claim shall be effected by an instruction to cancel a particular claim number. Identifying the status of a claim in the claim listing as "canceled" will constitute an instruction to cancel the claim.

(5) *Reinstatement of previously canceled claim.* A claim which was previously canceled may be reinstated only by adding the claim as a "new" claim with a new claim number.

12. The amendment to the specification does not comply with 37 CFR 1.121

(b)(1)(ii), see revised amendment practice of 7/30/2003; which requires markings to show changes. This specification amendment is also allowed at this time, however.

Response to Arguments

13. Applicant's arguments filed 2/27/2004 have been fully considered but they are not persuasive.

The use of references, Maloney et al and Hirayama et al in combination teach reverse body biasing in a standby mode, which is construed to be a form of an operating condition or mode in that it is powered-up state or mode; and not in an Off or non-powered state or mode.

Furthermore, Maloney et al suggests a resistive element may be used in place of NFET 508 and equivalent devices to provide reverse bias, see 4:43-51.

Maloney et al also suggests the use of a voltage potential larger than V_{cc} which is clamped to a voltage core supply, see 7:20-24.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A Demakis whose telephone number is 571.272.2050. The examiner can normally be reached on 7:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571.272.2800 ext. 36. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Demakis



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